REMARKS

Applicant thanks Examiner Hogans for the courtesies extended to Applicant's representative during the September 4, 2003 personal interview. The points discussed are incorporated into the remarks below and constitute the Applicant's record of the interview.

Claims 1-13 and 15-17 are pending in this application. By this Amendment, claim 1 is amended and claims 18-33 are canceled without prejudice to or disclaimer of the subject matter contained therein. No new matter has been added.

The support for the amendments to claim 1 is found on page 13, lines 15-21 of the specification.

For the following reasons, Applicant submit that this application is condition for allowance. Favorable reconsideration is respectfully requested.

I. Reply to Rejections

On page 2, item 2 of the Office Action, claims 1-4 and 6-11 are rejected under 35 U.S.C. §102(e) over U.S. Patent No. 6,110,531 to Paz de Araujo et al. (hereinafter "Paz"). The rejection is respectfully traversed.

It is respectfully submitted that Paz fails to disclose a method for manufacturing ceramics comprising a step of forming a ceramic film on a substrate by mixing a fine particle of a raw material species which becomes at least part of raw materials for ceramics with an active species having high kinetic energy, and feeding the mixed fine particle and active species to the substrate so that the fine particles of the raw material species are deposited on the substrate while being provided with kinetic energy from the active species, wherein the ceramic film is formed by an LSMCD process or a misted CVD process, as recited in claim 1.

Paz discloses carrier gases that pass through the liquid source in container 20 to become saturated with the liquid source and then feed into manifold 14 through tube 40 (col.

5, lines 25-28, Fig. 1). The carrier gases are typically argon or nitrogen, and are controlled to produce mist of desired droplet size and a mass flow rate to enable the liquid droplets to vaporize at a relatively low temperature to avoid premature deposition (col. 9, lines 23-29). Paz discloses that the carrier gases may be inert or active and may contain a catalyst to increase the deposition rate (col. 5, lines 28-30). However, Paz fails to define the term "active", and by extension, fails to disclose active species.

The specific passages cited in the Office Action do not disclose that the carrier gases are the active species that have high kinetic energy and that allow the raw material species to be deposited on the substrate while being provided with kinetic energy from the active species, as recited in claim 1. For instance, col. 3, lines 10-15 discloses that ion-coupled plasma (ICP) excitation of the reactant gas (i.e., the gas phase mixture containing reagents, not carrier gas, (col. 8, lines 35-38)) in a deposition chamber accelerates the rate of decomposition and reaction by overcoming kinetic barriers to reaction without adding heat to the reaction. That passage discusses kinetic barriers to reaction, which is overcome, instead of an active species providing a kinetic energy to the raw material.

Col. 5, lines 20-30 of Paz fails to define what an active species is meant, and discloses only a carrier gas. Paz is silent as to the role of the carrier gases such as oxygen other than the flow of the carrier gases enable measurement and control of the flow rate and composition of the process streams, and thus, the stoichiometry of the deposited thin film (col. 9, lines 1-5). Paz, therefore, does not disclose active species as recited in claim 1.

Further, Fig. 3 of Paz shows a plasma generator 136 that provides energy from other reaction enhancement means. The disclosure is directed toward providing energy supplied to the reaction system by the substrate heater 132 or an equivalent alternative energy supply system, which is the plasma generator 136. Passages in Paz discloses means for heating liquid reagents (col. 2, lines 56-60), ultrasonically atomizing liquid source while carrier gases

ae passed (col. 5, lines 47-55), and microwave sources (col. 6, lines 50-55) that may affect both the reagent and carrier gases in Paz. However, that particular disclosure does not disclose an active species that is providing kinetic energy to the raw material species, as recited in claim 1, nor a reasonable interpretation find an active species in Paz's disclosure.

As disclosed in page 4, line 26 - page 5, line 15 and page 13, line 15 - page 14, line 4, of the specification, use of active species to provide kinetic energy to the raw material species allows control of deposition rate of smaller diameter of raw materials while still providing good side on bottom coverage when forming a ceramic film, and increase the migration energy of the atoms in the film to allow formation of ceramic film having good crystallity formed at lower process temperature. Paz fails to appreciate such problems and solutions exits.

Therefore, in addition to the above, nowhere in Paz is it disclosed that the fine particles of the raw material species are deposited on the substrate while being provided with kinetic energy from the active species, as recited in claim 1. In fact, Paz fails to disclose how the thin film superlattice is formed. Consequently, claim 1 is patentably distinguishable from Paz. Claims 4 and 6-11, which depend from claim 1, are likewise patentable over the applied reference for at least the reasons discussed above and for the additional features they recite. Withdrawal of the rejection of claims 1, 4, and 6-11 is respectfully requested.

On page 4, item 4 of the Office Action, claims 1, 2, 5 and 15-17 are rejected under 35 U.S.C. §103(a) over U.S. Patent No. 6,232,167 to Satoh et al. (hereinafter "Satoh"), in view of U.S. Patent No. 5,456,945 to McMillan et al. (hereinafter "McMillan"). The rejection is respectfully traversed.

It is respectfully submitted that the combination of Satoh and McMillan fails to disclose a method for manufacturing ceramics comprising a step of forming a ceramic film on a substrate by mixing a fine particle of a raw material species which becomes at least part of

raw materials for ceramics with an active species having high kinetic energy, and feeding the mixed fine particles and active species to the substrate, so that the fine particles of the raw material species are deposited on the substrate while being provided with kinetic energy from the active species, wherein the ceramic film is formed by an LSMCD process or a misted CVD process, as recited in claim 1.

Again, Satoh and McMillan merely disclose carrier gases. These carrier gases do not provide kinetic energy to the raw materials. For example, Satoh discloses in col. 7, lines 21-26 that the titanium raw material are supplied to a film forming chamber with argon gas as a carrier gas and gaseous oxygen as a reaction gas with a specific flow rate of argon, bismuth raw material, titanium raw material and the flow rate of oxygen gas as given.

In col. 5, lines 7-12 of McMillan, the term "mist" is defined as a fine drop of liquid carried by a gas, and in col. 17, lines 51-56, the deposition process disclosed is used with argon carrier gas to flow the BST precursor mist over the substrate. Therefore, both Satoh and McMillan discloses use of carrier gases to control the reaction rate only.

Moreover, neither Satoh, McMillan, or their combination suggests or even appreciate the advantage of having an active species that provide kinetic energy to the raw material species.

Consequently, neither Satoh, nor McMillan, nor their combination discloses an active species having high kinetic energy or the fine particles of the raw material species that are deposited on the substrate while being provided with kinetic energy from the active species. Consequently, claim 1 is patentably distinguishable from the combination of Satoh and McMillan. Claims 2, 5 and 15-17, which depend from claim 1, are likewise distinguishable over the applied references for at least the reasons discussed above and for the additional features they recite. Withdrawal of the rejection of claims 1, 2, 5 and 15-17 is respectfully requested.

On page 6, item 6 of the Office Action, claim 3 is rejected under 35 U.S.C. §103(a) over Satoh in view of McMillan, in further view of U.S. Patent No. 6,146,905 to Chivukula et al. (hereinafter "Chivukula"). The rejection is respectfully traversed.

Chivukula fails to overcome the above discussed deficiencies of the combined Satoh and McMillan references and consequently, claim 3 is distinguishable on the basis of its dependence from claim 1, and for the additional features it recites. Withdrawal of the rejection of claim 3 is respectfully requested.

On page 7, item 7 of the Office Action, claim 12 is rejected under 35 U.S.C. §103(a) over Satoh in view of McMillan, in further view of U.S. Patent No. 5,563,762 to Leung et al. (hereinafter "Leung"). The rejection is respectfully traversed.

Leung fails to overcome the deficiencies in the combined Satoh and McMillan references as discussed above and therefore, claim 12 is distinguishable over the combination of Satoh, McMillan and Leung on the basis of its dependence from claim 1 and for the additional features it recites. Withdrawal of the rejection of claim 12 is respectfully requested.

On page 7, item 8 of the Office Action, claim 13 is rejected under 35 U.S.C. §103(a) over Satoh in view of McMillan, in view of Leung, and in further view of U.S. Patent No. 5,932,904 to Hsu et al. (hereinafter "Hsu"), and in further view of U.S. Patent No. 6,207,236 to Araki et al. (hereinafter "Araki"). The rejection is respectfully traversed.

Neither Hsu nor Araki nor their combination overcomes the deficiencies of the combined Satoh, McMillan and Leung references as discussed above. Consequently, claim 13 is patentably distinguishable from the combination of Satoh, McMillan, Leung, Hsu and Araki for its dependence from claim 1, and for the additional features it recites. Withdrawal of the rejection of claim 13 is respectfully requested.

II. Conclusion

For the reasons stated above, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-13 and 15-17 are respectfully requested.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Seth S. Kim
Registration No. 54,577

JAO:SSK/tbh

Date: September 9, 2003

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461